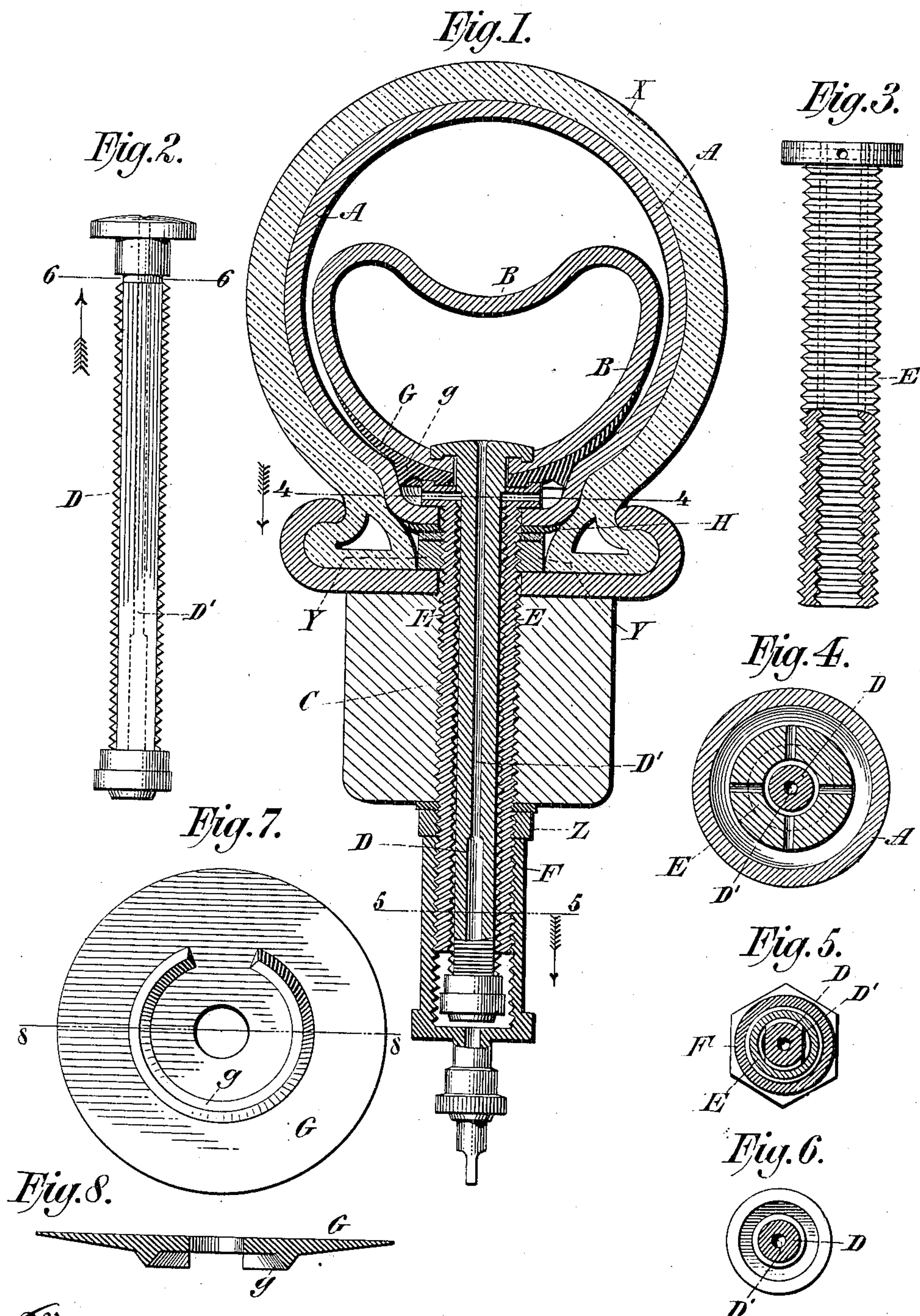


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PATENTED DEC. 4, 1906.

H. C. FAIRCHILD.  
PNEUMATIC TIRE.  
APPLICATION FILED MAR. 30, 1905.



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## PNEUMATIC TIRE.

No. 837,458.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed March 30, 1905. - Serial No. 252,862.

*To all whom it may concern:*

Be it known that I, HARRY C. FAIRCHILD, a citizen of the United States of America, residing at Passaic, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Pneumatic Tires for Vehicles, of which the following is a specification.

My invention relates to a pneumatic tire having within the usual flexible inflatable tube a reserve or idle flexible inflatable tube, both tubes being inclosed within the outer casing of a clencher-tire, but detached from the inner portion of the outer casing of the tire, said inflatable tubes being attached to the rim and held in proper relation to each other by an air-valve having within it a second air-valve, said valves being arranged to inflate the said tubes independently, my invention being particularly adapted to wheels having clencher-rims.

The objects of my invention are, first, it obviates the necessity for removing the outer casing on the road in the event of a puncture, as the reserve or idle tube may be immediately inflated by simply pumping air into it; second, by being unattached to the outer casing it is lighter and more simply manufactured; third, the construction of my valves avoids the material enlargement of the valve-stem in the use of two valves and does not require an aperture in the rim of the wheel large enough to weaken the rim; fourth, the use of one valve within the other obviates the necessity for two entrances at different points to the inflatable tubes, and thus affords less opportunity for air leakage, as in the case of several entrances to a pneumatic tube; fifth, my construction of one valve within the other keeps the inner valve free from dust, clean, and protected and provides a substantial support for the valve and inner tube.

My invention consists of the devices herein set forth.

In the accompanying drawings, Figure 1 is a central vertical section of my improved tire. Fig. 2 is a side view of the valve-stem, Fig. 3 is a side view of the sleeve valve-stem, partly broken away. Fig. 4 is a longitudinal section on the line 4 4, Fig. 1, looking in the direction of the arrow and with the outer tire removed. Fig. 5 is a longitudinal section on the line 5 5, Fig. 1, looking in the di-

rection of the arrow. Fig. 6 is a longitudinal section on the line 6 6, Fig. 2. Fig. 7 is a plan view of the washer. Fig. 8 is a sectional view on the line 8 8, Fig. 7.

Similar letters are used to designate similar parts throughout the drawings.

My improved tire is provided with the outer flexible inflatable tube A and the inner or reserve flexible inflatable tube B, inclosed within the outer casing X of a clencher-rim, said tubes being connected to the rim and held in proper relation to each other by the air-valve C, Fig. 1. The reserve or idle inflatable tube B is of flexible rubber and is arranged to fit snugly within the tube A, which also is of rubber, so as to cling closely to the rim when the wheel is in motion, and is shown for purposes of illustration, Fig. 1, slightly inflated. The valve C consists of the stem D, a sleeve E, and an inclosing case or cap F.

The stem D is provided with a channel D', extending its entire length, and has upon its inner end a shoulder-bolt head and upon its outer or felly end an air-cap. The stem D is screw-threaded on two of its outer sides and flattened on the other two sides, Figs. 2 and 5, the screw-thread being omitted and the stem made round and slightly smaller just below the shoulder-bolt, line 6 6, Fig. 2, this construction and also the flattening of the sides being for the purpose of admitting air to the channels in the extended circular disk on the sleeve E, and thence to the tube A. The stem D is provided at its outer or felly end with an air-cap.

The sleeve E is screw-threaded within to engage the valve-stem D and on its outside for rim-and-felly adjustment and has at its inner end an extended circular disk, with channels opening on the rim of the disk and connecting with the inner portion of the sleeve, Figs. 3 and 4. This extension-disk serves a three-fold purpose—first, as a stopper for the air-trance to the tube A; second, to admit air to the tube A through the channels, and, third, as a nut to the valve-stem D and holding the washer G securely in place.

The inclosing cap F is screw-threaded on the inside to engage with the sleeve E and is provided at its lower extremity with an air-cap. The inclosing cap F also furnishes a chambered space for the air-cap of the valve-stem D, Fig. 1. My device is also provided



with a rubber washer G, having a V-shaped annular shoulder, which is broken for a portion of the circle to admit air to the tube A, Figs. 1, 7, and 8.

5 The adjustment of my improved tire is as follows: The shoulder-bolt head of the valve-stem D is passed through an aperture or entrance in the reserve or idle inflatable tube B, the bolt-head being brought against the inner  
10 portion of the tube. The washer G is placed over the valve-stem D, with the V-shaped shoulder toward the rim of the wheel and cemented or vulcanized to the tube B. The sleeve E is screwed over the stem D, so that  
15 the extension-head of the sleeve comes in contact with the washer G. The reserve tube B is then worked into the tube A until an aperture-entrance in the tube A is brought in correspondence with the entrance or aperture in the tube B, having the valve D there-  
20 in, and to provide against friction when the wheel is in motion powdered soapstone or other suitable substance may be dusted between the inflatable tubes A and B. A rubber patch-washer H is passed over the sleeve  
25 E and cemented or vulcanized to the tube A, and the inner lock-nut Y (with metal washer) is screwed in place, drawing together the parts already adjusted. The inflatable tubes  
30 A B are then arranged within the outer casing of the tire and with it to the rim of the wheel, the sleeve E passing through the rim and felly, if a felly is used. The outer lock-nut Z is screwed in place and the inclosing  
35 cap F screwed over the extended portion of the sleeve E, the air-cap of the inclosed valve coming within the chambered space thereof.

The operation of my device is as follows: The air-cap of the inclosing cap F is removed  
40 and the air-pump applied to the exposed air-valve, thus forcing the air through the sleeve E, along the flattened sides of the valve-stem D, through the channels of the extension-head of the sleeve E, and through the broken  
45 portion of the V-shaped shoulder of the washer G, inflating the tube A, the tube B remaining uninflated and in reserve or idle. In the event of a puncture of the tube A the inclosing cap F is removed, exposing the air-  
50 cap at the end of the valve-stem D, which is also removed and the air-pump applied thereto, the air passing through the port or channel of the valve-stem D and inflating the inner tube B, which thus backs up or reinforces the punctured tube A, practically tak-  
55 ing the place thereof. To reduce the danger from the bursting of the tire or puncture under high speed or racing, both the tubes A B may be inflated before starting. The exterior of the inner or reserve tube B may or  
60 may not be attached to the interior of the tube A. If attached, it may be done by cement at intervals or thus attached to the

tube A around the entire circumference of the tube B within a short space of the valve 65 in either direction.

I am aware that others have arranged air-compartment devices in various relationship to each other and attached to the outer casing of the tire; but to my knowledge no one 70 has ever placed one flexible tube within another, leaving them both detached from the inner portion of the outer casing of the modern clencher type of tire.

Having fully described my invention, what 75 I claim, and desire to secure by Letters Patent, is—

1. A pneumatic tire for vehicle-wheels comprising the clencher-rim, the outer casing having its shouldered edges secured in said 80 rim, the outer flexible inflatable tube within said casing and independent thereof, the reserve flexible inflatable tube within said outer inflatable tube, the valve-stem having the head and an air-passage through it and  
85 through said head, the sleeve on said valve-stem having the head with air-channels therein communicating with the interior of said sleeve, and the washer having the annular shoulder broken in part; said valve-stem, 90 sleeve and washer being adapted to secure said outer casing and outer and reserve inflatable tubes in proper relation to each other and to the rim of the wheel and to in-  
95 flate independently said outer and reserve inflatable tubes, substantially as set forth.

2. In a pneumatic tire for vehicle-wheels having the clencher-rim, the outer casing secured to said rim, the outer flexible inflatable tube within said casing but independent 100 thereof, the reserve flexible inflatable tube within said outer inflatable tube, the washer having the annular shoulder broken in part and the inclosing air-cap, the combination of the externally-threaded and flattened valve- 105 stem having the head on its inner end and an air-passage through it and through said head and the internally and externally threaded sleeve having the head on its inner end with the channels therein communicating with the 110 interior of said sleeve and with the air-space formed by the annular shoulder of the washer and the inner surface of the outer inflatable tube, substantially as described.

3. In a pneumatic tire for vehicle-wheels 115 the washer having upon one face the annular shoulder broken in part, substantially as described and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of 120 two subscribing witnesses.

HARRY C. FAIRCHILD.

Witnesses:

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N. A. EMLAW.